



Division of Water Cruise Ship Program

Alaska Department of Environmental Conservation

CPVEC Sample Data

2000-2009

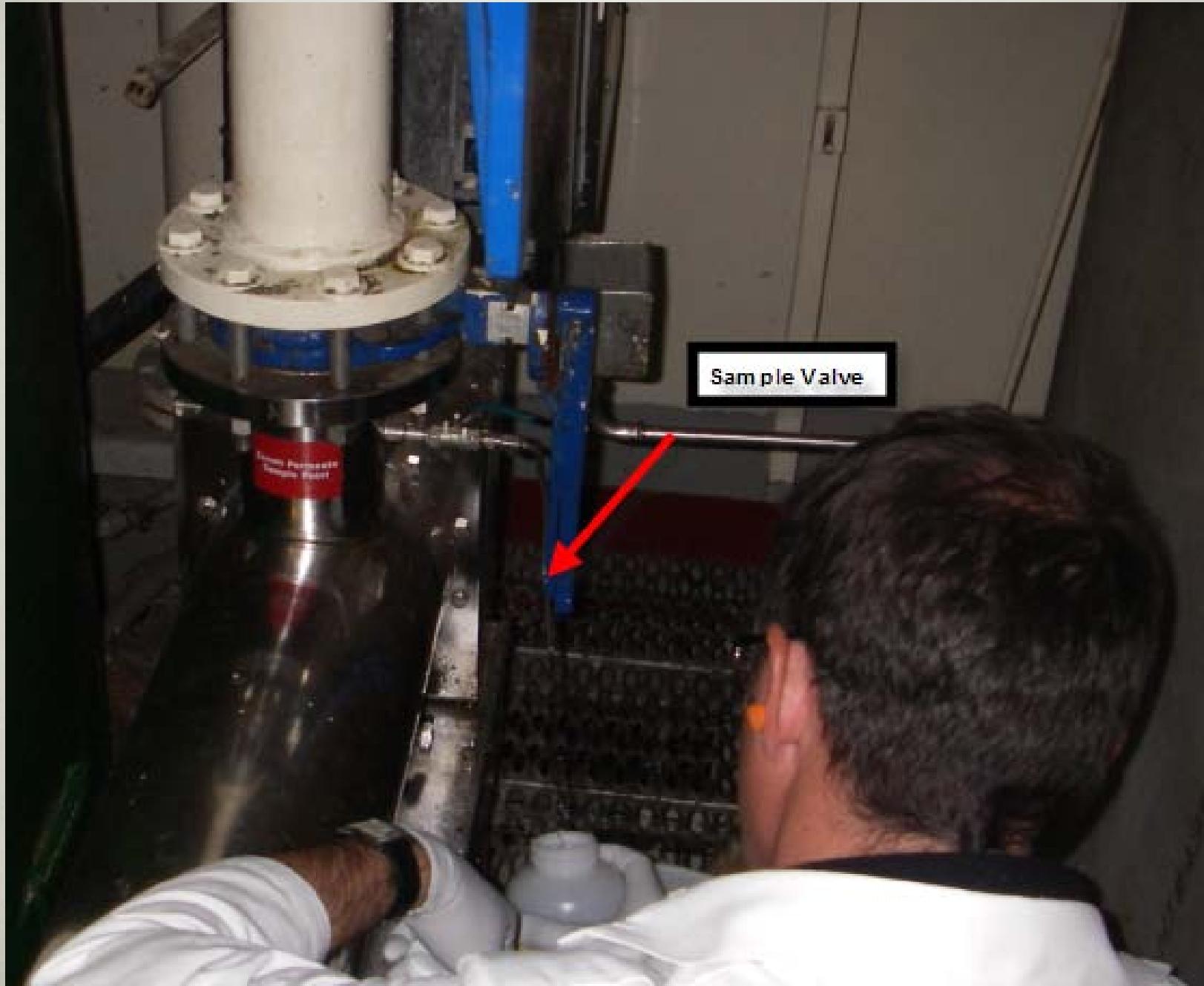
Ed White
CPVEC Environmental Program Specialist

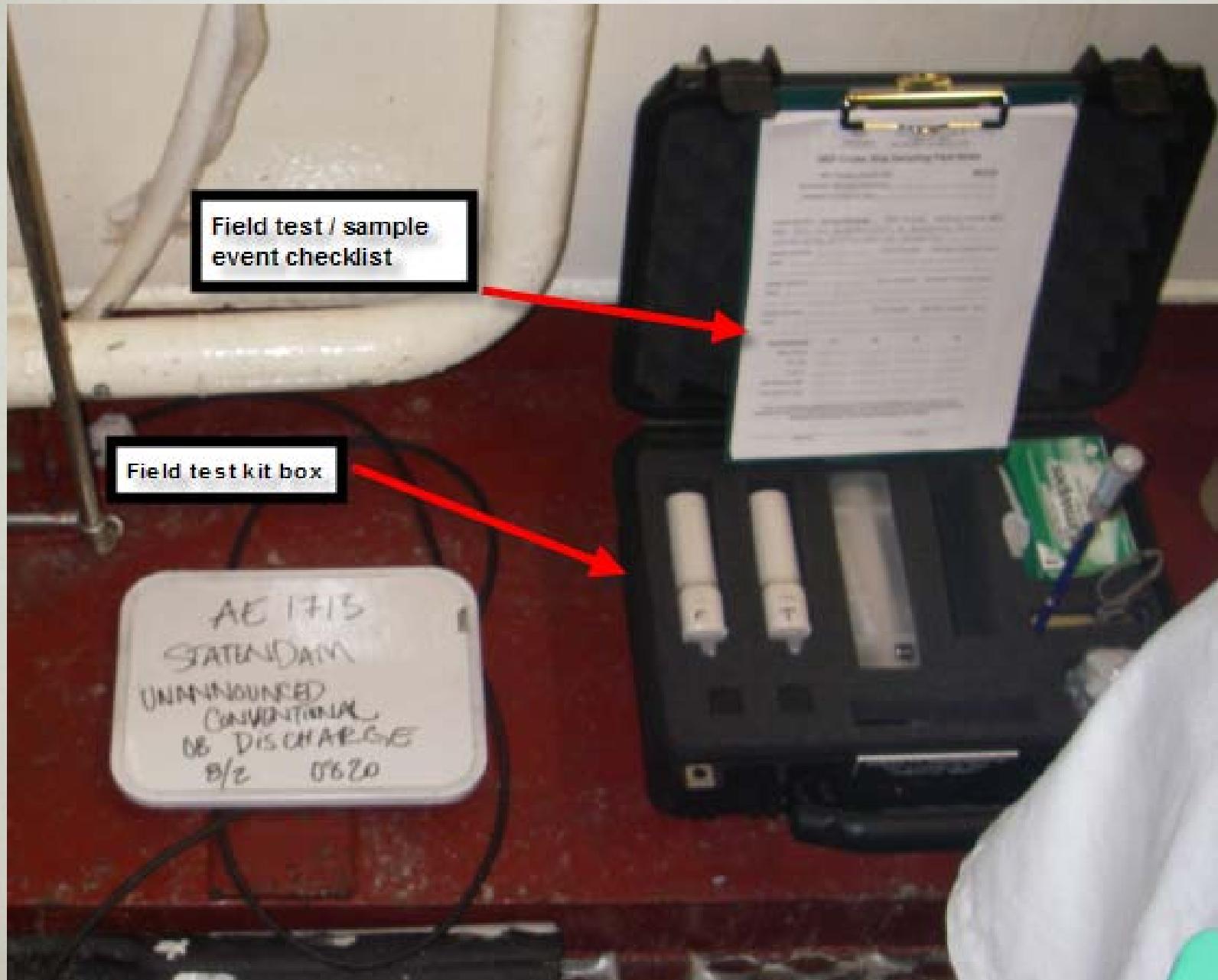
Definitions

- Blackwater – water with human waste
- Graywater – sink, shower, galley wastewater
- mg/L - 1/1,000 gram per liter
- µg/L - 1/1,000,000 gram per liter

Why Sample?







Ensuring samples are representative

- Quality Assurance/Quality Control Plan
- Vessel Specific Sampling Plan
- Field notes, chain of custody
- Unannounced sampling
- Blind duplicates
- Field audits
- Lab audits

*North West CruiseShip Association
Discharge of Effluents in Certain Alaska Waters by Cruise Vessel
Operations*

**2009 Operating Season
Quality Assurance/Quality Control Plan
For
Sampling and Analysis of Treated Sewage and
Graywater
From
Commercial Passenger Vessels**

*Submitted to fulfill certain requirements of
33 CFR 159 United States Title 33 Code of Federal Regulations Part
159 and Alaska Statute 46.03.460 – 46.03.490 and 18 AAC 69*

176 Parameters Sampled

- “Conventional”- pH, Fecal Coliform, BOD, TSS, Chlorine. (16 parameters)
- “Priority”- VOCs (70), BNAs (65), metals (25).
- General Permit- Ammonia, Copper, Nickel, Zinc twice a month.

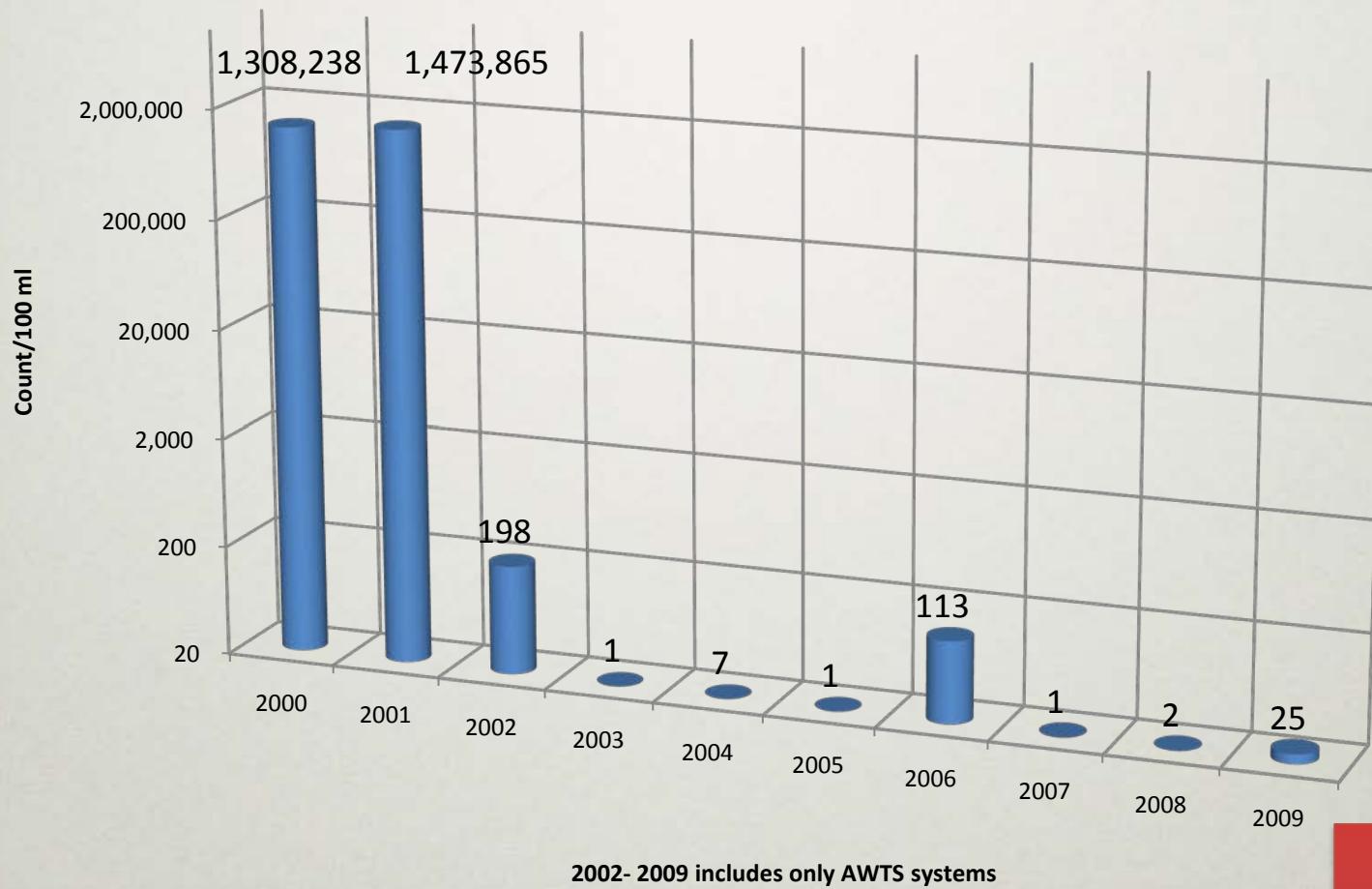
Sample Data Notes:

- Frequency of samples taken varies over time
- Number of ships sampled changes, individual vessels change
- Metal filtering method changed

Conventional Parameters

- pH
- Fecal Coliform
- Biochemical Oxygen Demand (BOD)
- Total Suspended Solids (TSS)
- Chlorine
- Nutrients
- Alkalinity

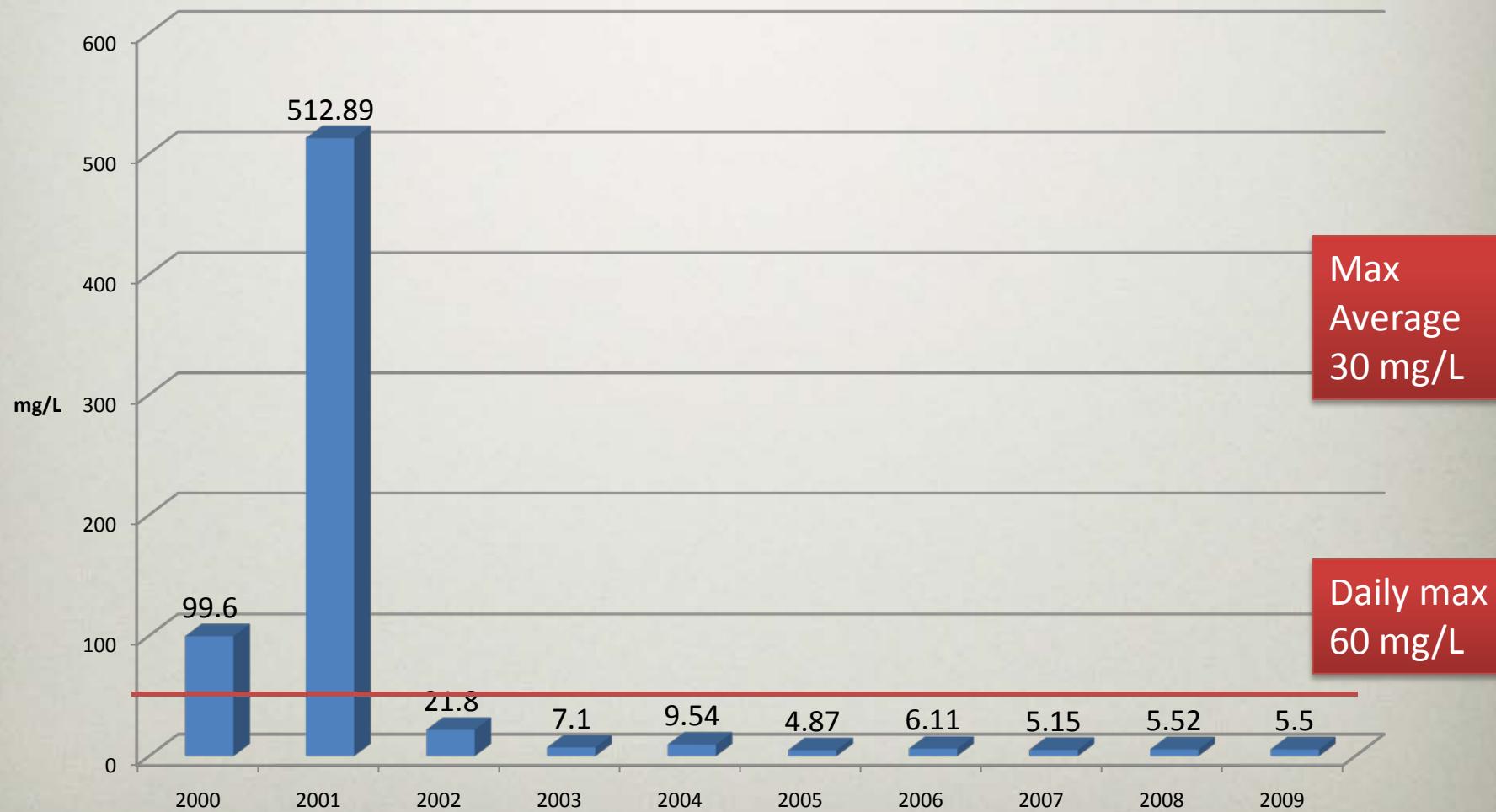
Fecal Coliform Averages 2000-2009



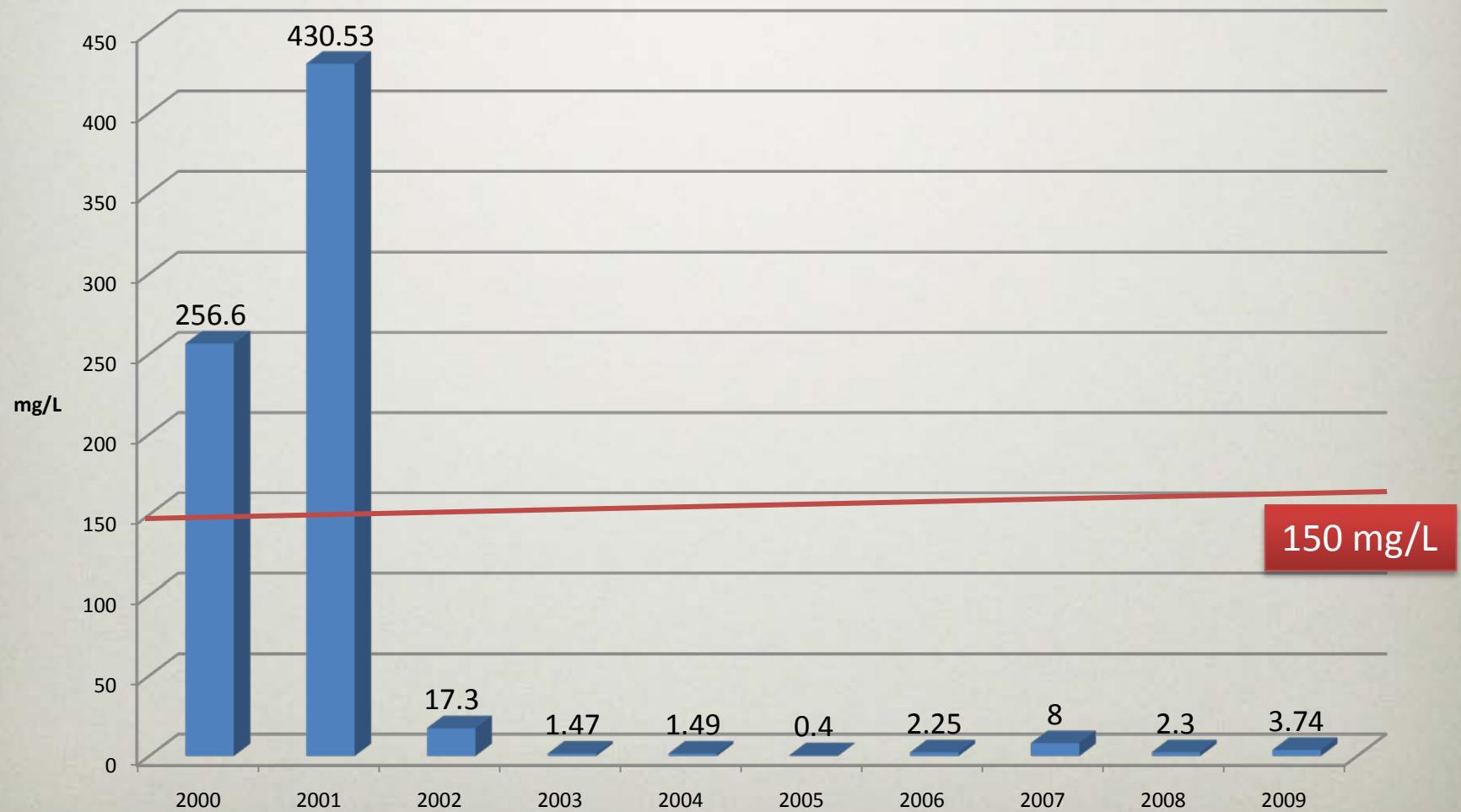
2002- 2009 includes only AWTS systems

Average
14 FC/100 mL
Daily Max
43FC/100ml

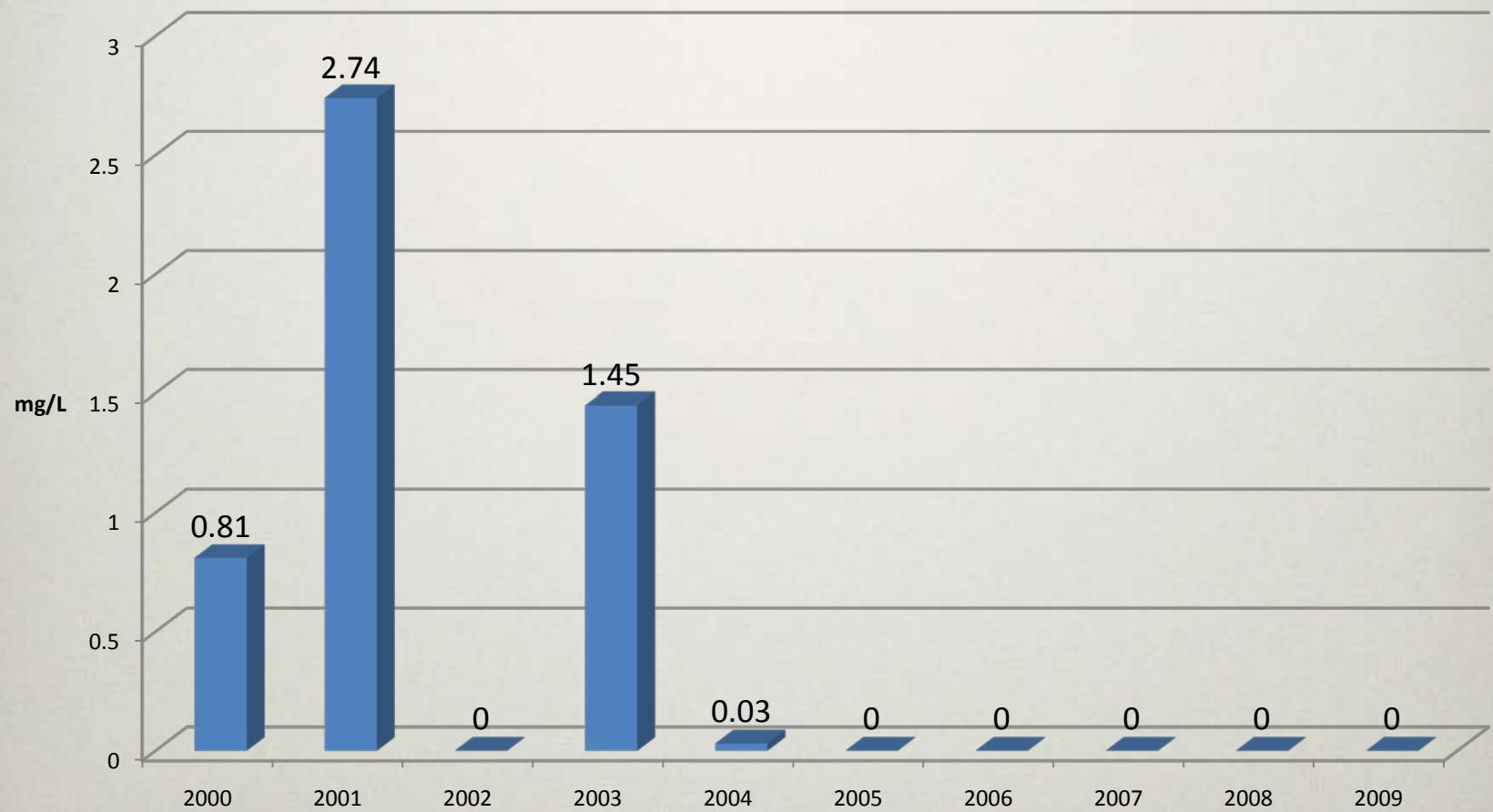
Biochemical Oxygen Demand



Total Suspended Solids (TSS)

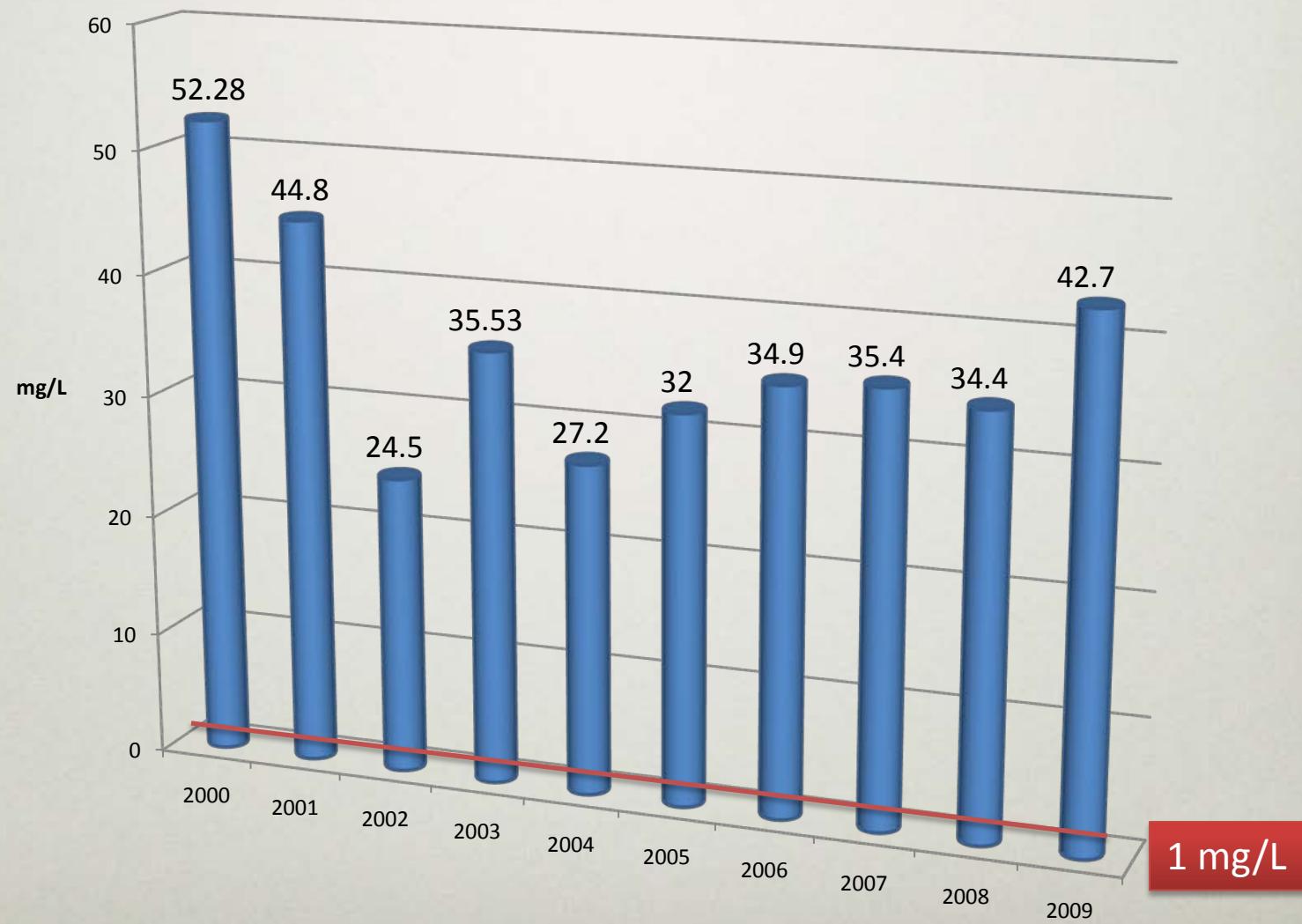


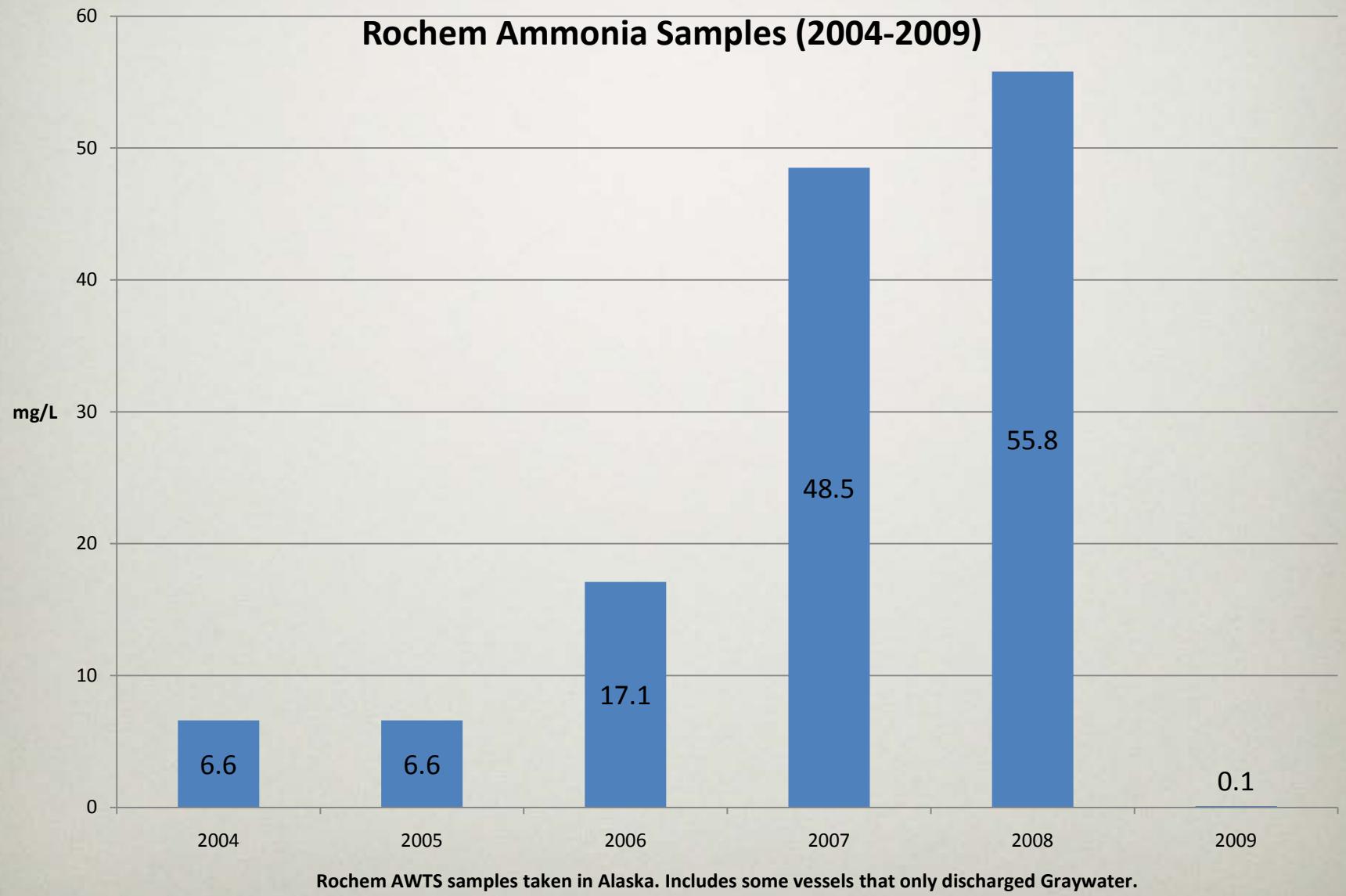
Chlorine Averages 2000-2009

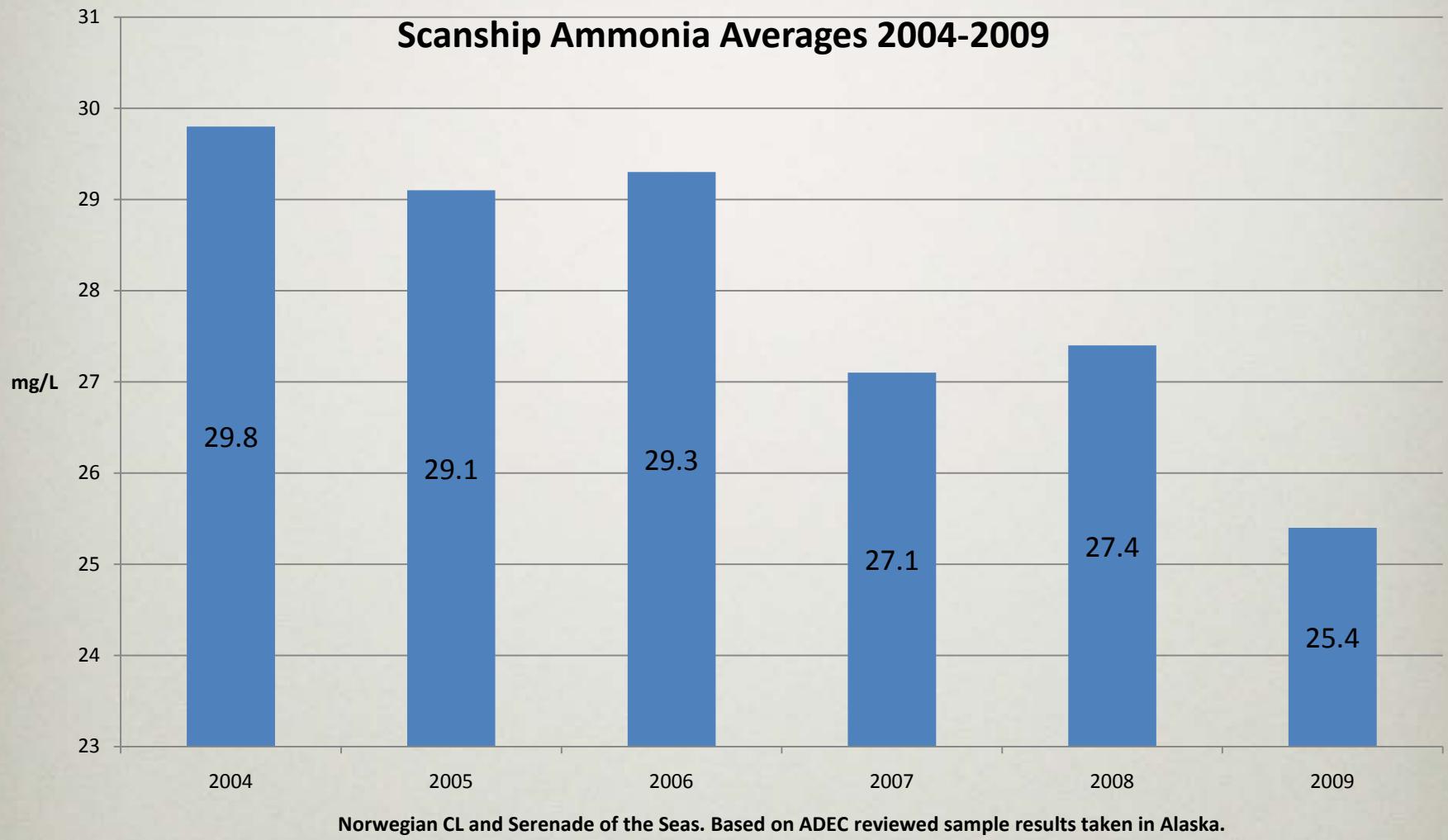


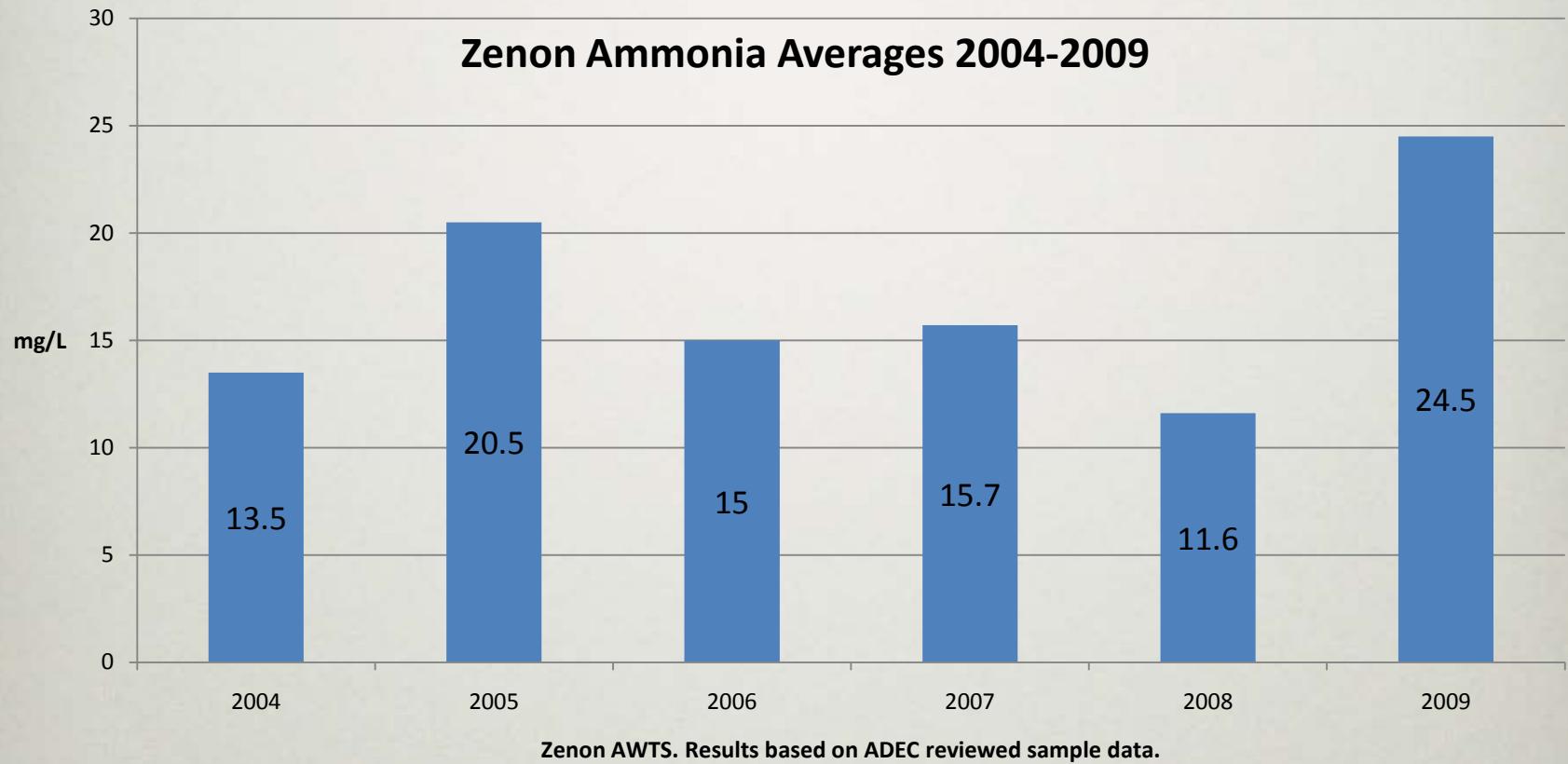
0.0075 mg/L

Ammonia Averages 2000-2009

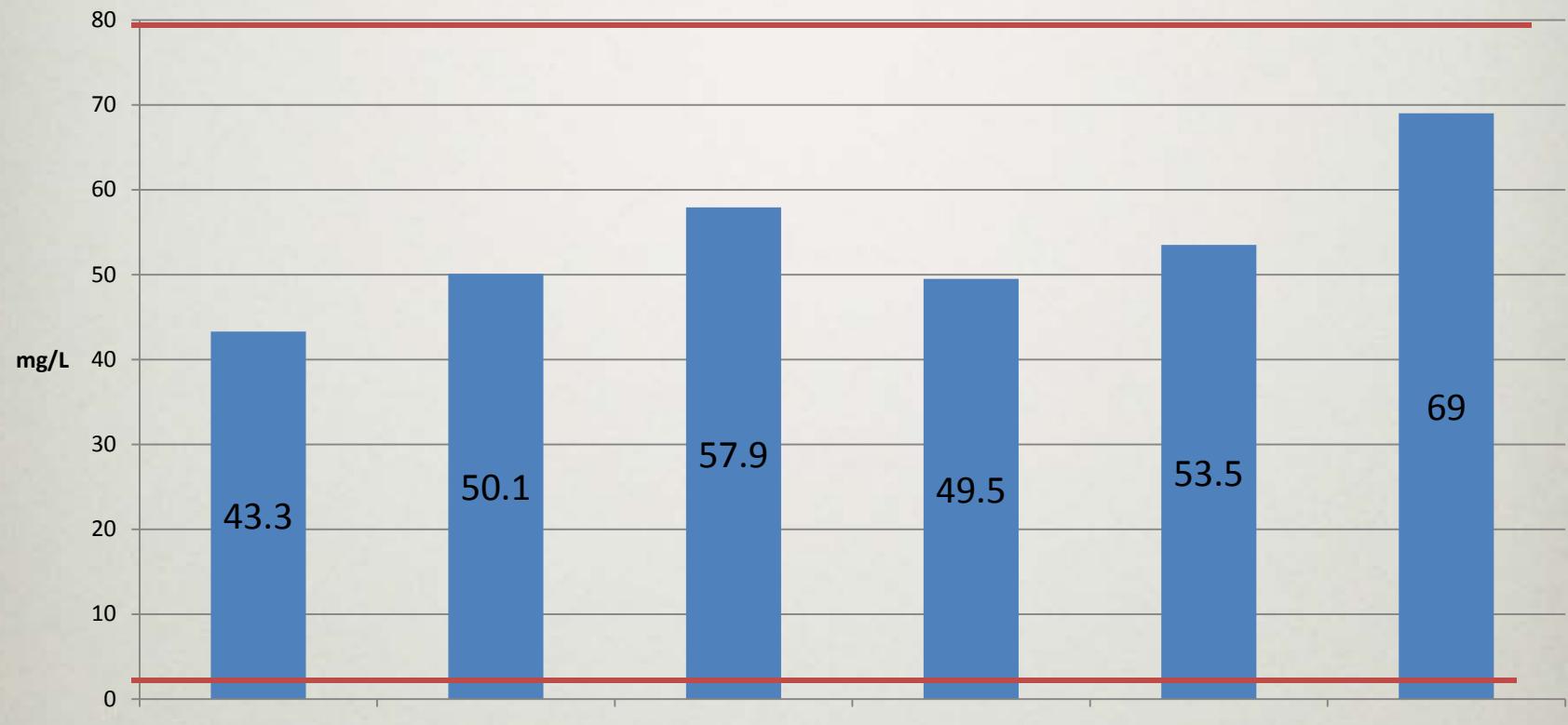






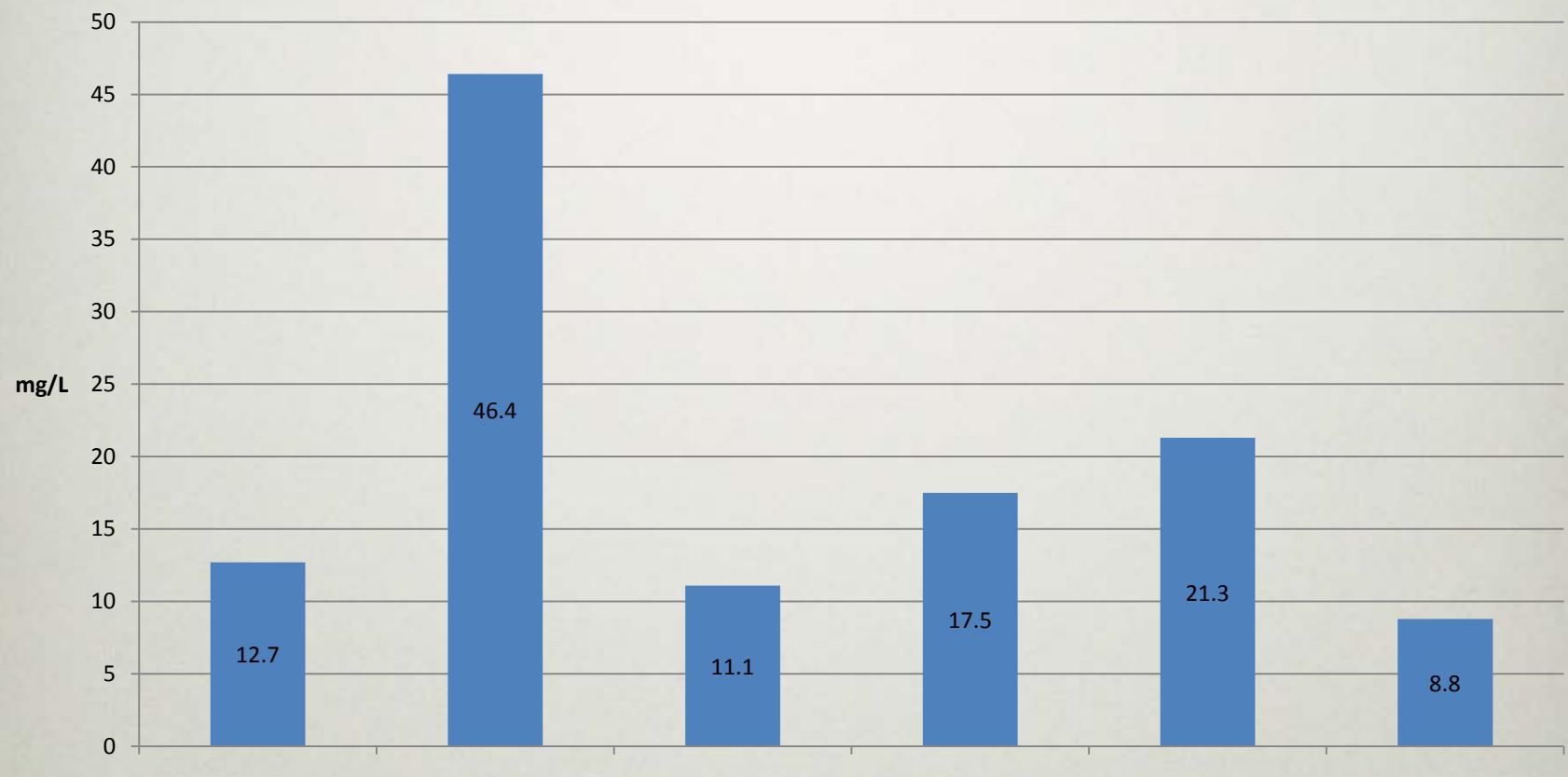


Hamworthy (Princess) Ammonia Averages 2004-2009



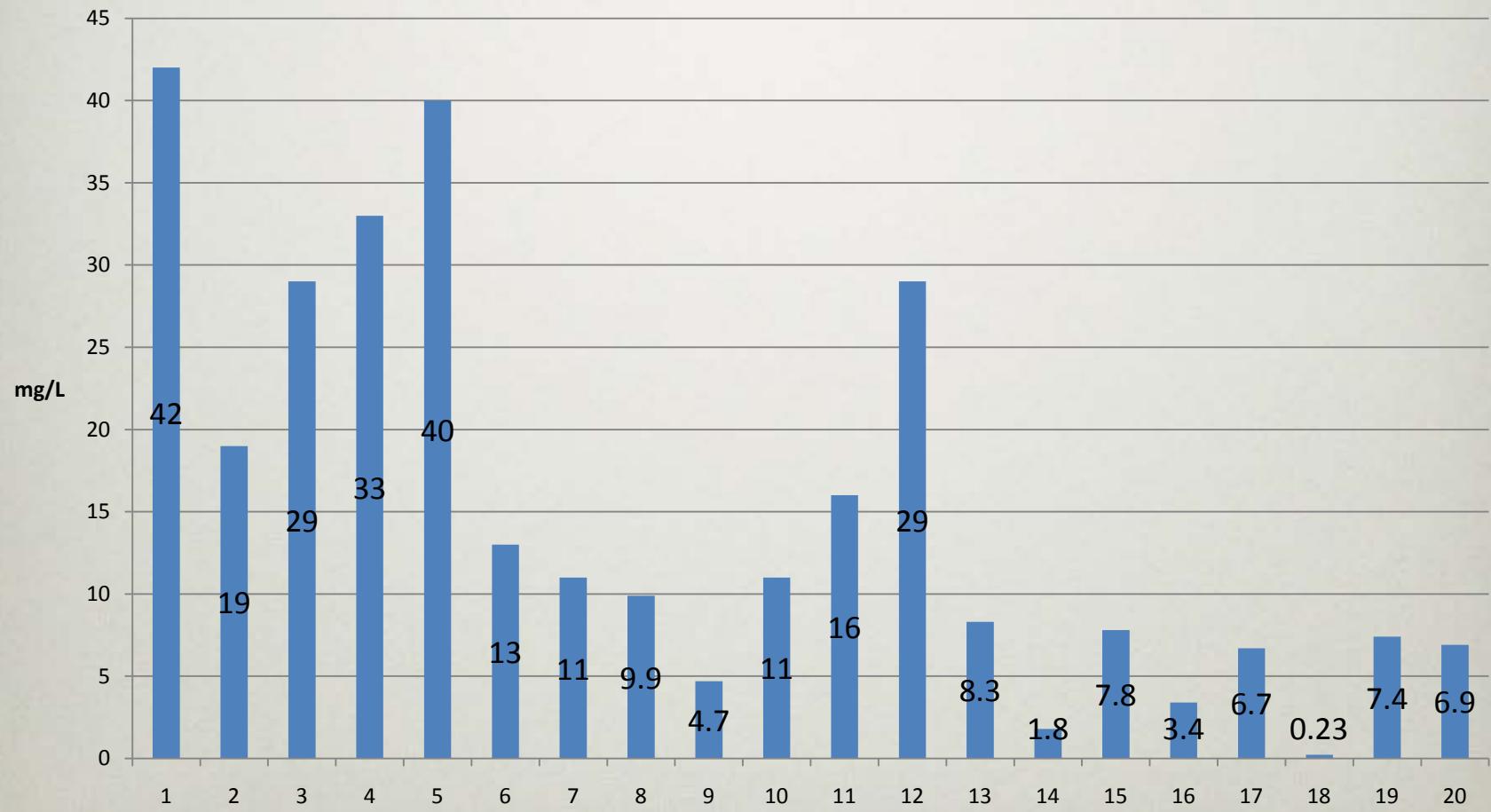
Hamworthy AWTS. Based on ADEC reviewed sample results taken in Alaska.

Hamworthy (Seven Seas Mariner) Ammonia Averages 2004-2009



Hamworthy AWTS. Based on ADEC reviewed sample results taken in Alaska.

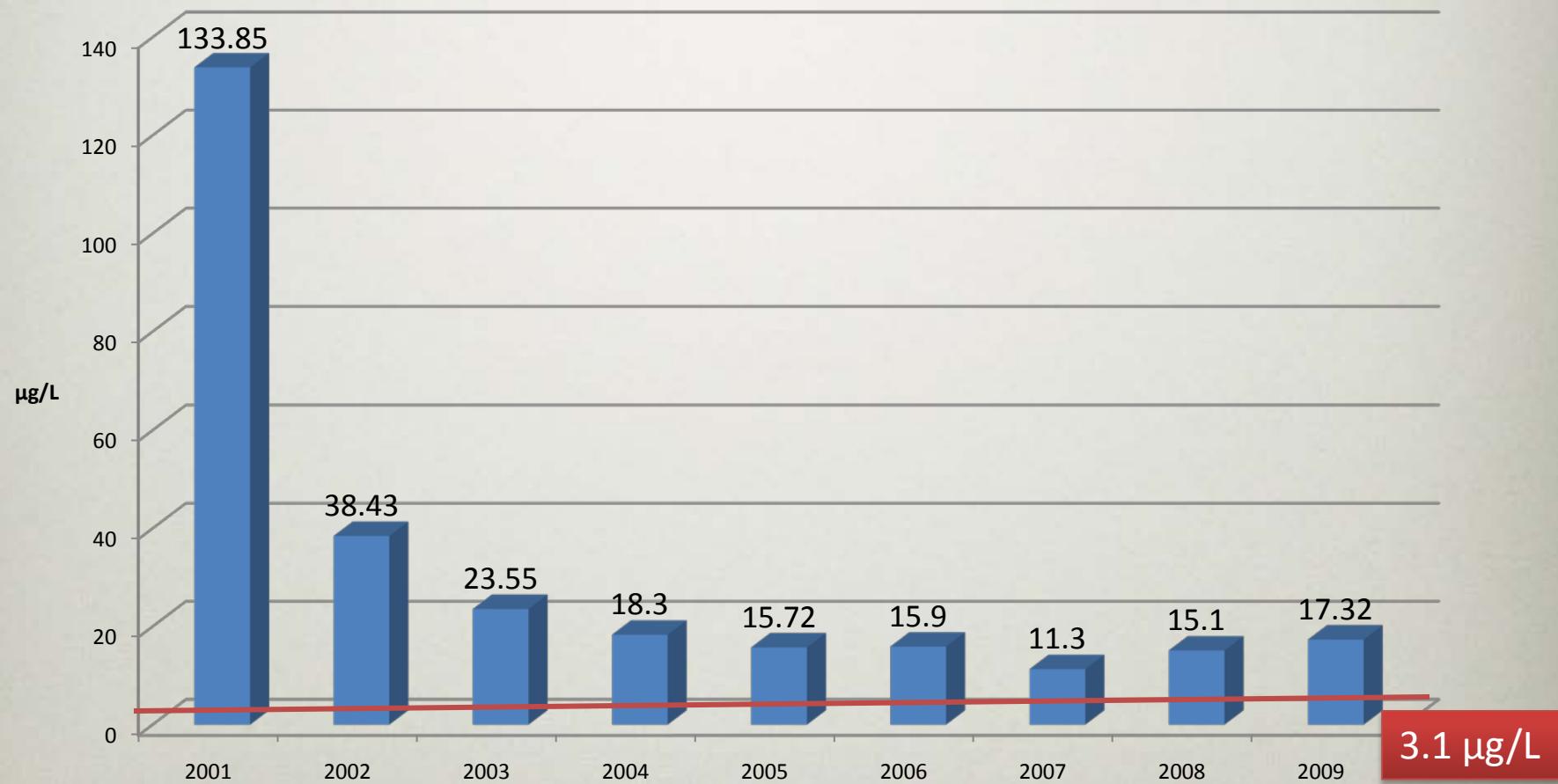
Seven Seas Mariner 2008-2009 Results



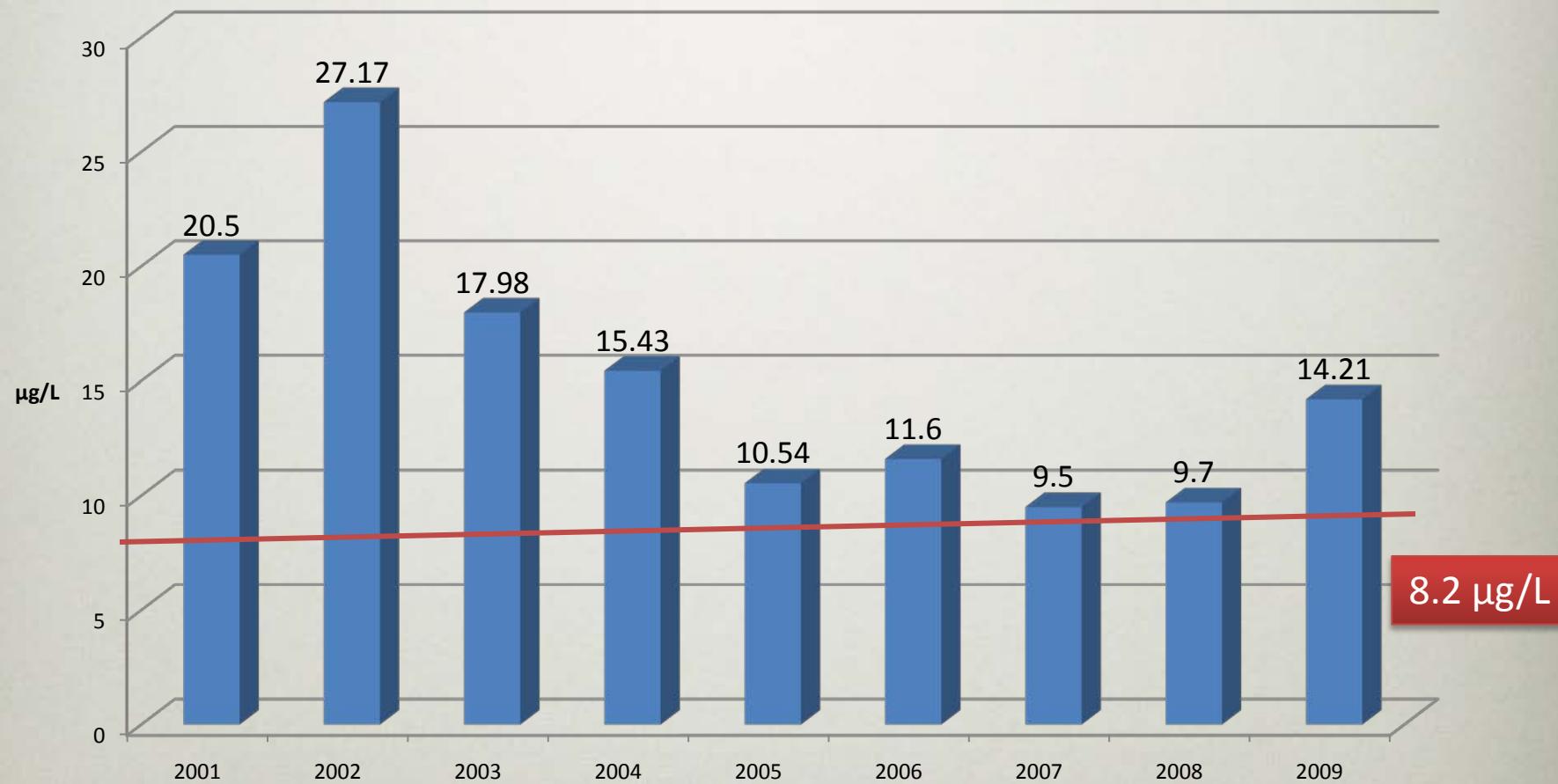
Priority Parameters

- Metals
- Volatile Organic Compounds (VOCs)
- Base/Neutral Acids (BNAs)

Copper(Dissolved)



Nickel (Dissolved)



Zinc (Dissolved)



Thank You

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http://www.dec.state.ak.us/water/cruise_ships/reports.htm